Syndesmotic Injury in Tibial Plafond Fractures Is Associated with Worse Patient Outcomes

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Purpose: Syndesmosis or syndesmotic equivalent injuries occur in 15% of tibial plafond injuries. In rotational ankle fractures, patients with associated syndesmosis disruption are reported to have inferior clinical outcomes compared to ankle fracture patients without syndesmosis disruption. The purpose of this study was to compare postoperative complications and patient-reported outcomes between tibial plafond fracture patients with and without syndesmotic injury.

Methods: All skeletally mature patients with a tibial plafond fracture (OTA 43-B and OTA 43-C) treated at an academic Level I trauma center from 2010-2019 with a minimum of 12 months of follow-up were retrospectively reviewed. Syndesmotic injury was based on a positive intraoperative manual stress examination and evidence of reduction and fixation of the syndesmosis at the time of injury. Patients completed Patient-Reported Outcomes Measurement Information System (PROMIS) physical function (PF) and pain interference (PI) outcome measures at final follow-up. Statistical analysis was performed using $\chi 2$ for categorical variables and Wilcoxon rank sum test for continuous variables.

Results: 174 patients met study criteria, including 46 patients with a syndesmotic injury and 128 patients without a syndesmotic injury. Mean follow-up was 63 months (range, 12-125 months). Demographics including gender, tobacco use, body mass index, and follow-up were similar between cohorts. The cohort with syndesmotic injury had significantly older patients (48 years vs 41 years, $P = 0.01$) and more open fractures (17 of 46 fractures vs 19 of 128 fractures, $P = 0.001$). Patients with syndesmotic injury had higher rates of postoperative infection (syndesmosis injury = 15.2%, no syndesmosis injury = 8.6%, $P = 0.2$) and nonunion (syndesmosis injury = 13.0%, no syndesmosis injury = 10.2%, $P = 0.59$), but these were not statistically significant in this cohort size. Patients with syndesmotic injury had significantly more ankle fusions (10 of 46, 22%) than patients without syndesmotic injury (11 of 128, 8.6%) ($P = 0.02$). Patients with syndesmotic injury had significantly worse PROMIS PF scores (44.3, standard deviation [SD] = 7.78) as compared to patients without syndesmotic injury (47.4, SD = 9.52) ($P = 0.04$). There was no difference in PROMIS PI scores between patients with syndesmotic injury (53.4, SD = 8.87) compared to those without syndesmotic injury (52.8, SD = 9.41) ($P = 0.61$).

Conclusion: Patients with a tibial plafond fracture and syndesmotic injury had significantly more ankle fusions and had worse PROMIS PF scores. A syndesmotic injury in the setting of a tibial plafond fracture may be an indicator of high-energy injury and seems to portend worse patient outcomes.